

Eresidae of Sudan (Araneida: Eresidae)

Hisham K. El-Hennawy
41, El-Manteqa El-Rabia St., Heliopolis, Cairo 11341, Egypt
E-mail: el_hennawy@hotmail.com

Abstract

Three species of only one genus of family Eresidae are recorded from Sudan, i.e., *Stegodyphus dufouri*, *S. lineatus*, and *S. manicatus*. The female of *S. m.* is redescribed with notes on its biology and habitat. A key to *Stegodyphus* species in Sudan and a map of their distribution are presented.

Keywords: *Stegodyphus manicatus*, Eresidae, Spiders, Sudan.

Introduction

There are about 80 spider species of 20 families recorded from Sudan. Family Eresidae C. L. Koch, 1850 is one of those families. It includes 100 species and subspecies, of 10 genera, among 40998 spider species all over the world (Platnick, 2009). Only three eresid species of genus *Stegodyphus* Simon, 1873 are recorded from Sudan. All of them are described and figured in the revision of the genus by Kraus & Kraus (1989).

Four juvenile *Stegodyphus* specimens were collected from Sudan on July 2008. They were collected from their nests on trees. Three of them died during transportation to Egypt and only one survived and reared in laboratory until becoming adult female. This adult one was identified as *Stegodyphus manicatus* Simon, 1876 and described below, with notes on its habitat and its biology. The distribution of the three *Stegodyphus* species of Sudan is plotted on a map, in addition to notes on the three species.

Abbreviations used: ALE = anterior lateral eye; AME = anterior median eye; Id = interdistance; L = length; PLE = posterior lateral eye; PME = posterior median eye; TL = total length; W = width. All measurements are in millimetres.

Systematics

Family **Eresidae** C. L. Koch, 1850
“Velvet spiders”

Diagnosis: Small to large (3-35 mm) araneomorph spiders; cribellate; entelegyne; legs with three tarsal claws; carapace convex, rectangular, with eight eyes; median eyes situated close together, with lateral eyes widely spaced; body usually clothed in a dense layer of short plumose setae (Jocqué & Dippenaar-Schoeman, 2006).

Distribution: Mostly Afrotropical and Palaearctic.

Genus ***Stegodyphus*** Simon, 1873

There are 21 species of genus *Stegodyphus*, most of them are recorded from Afrotropical and Palaearctic regions, with 2 species from Brazil and 4 species from Southeast Asia (Platnick, 2009). *Stegodyphus* spiders build their nests and webs on plants. Some of them are social spiders, i.e., living in colonies. The three species recorded from Sudan are solitary or “sub-social” (“non-permanently social” or “periodic-social”) species. The following information about these three species are extracted from literature, mainly from Kraus & Kraus (1989), in addition to photographs of alive specimens to facilitate identification.

Stegodyphus dufouri (Audouin, 1825) Figs. 1-2, 8, 10.

Eresus dufourii Audouin, 1825: 151-152, pl. 4, f. 12 (♀).

Eresus dufourii Audouin, 1827: 376-377, pl. 4, f. 12 (♀).

S. manicatus Simon, 1908: 80 (♂ only, misidentified).

S. niloticus Simon, 1908: 80-82 (♀).

S. d. Simon, 1910: 287, f. 4B (♂♀).

S. manicatus Simon, 1910: 288, f. 4C (♂ only, misidentified).

S. manicatus Berland & Millot, 1940: 158-159, f. 10C-D (♂, non ♀)

S. assumptioni Berland & Millot, 1940: 160, f. 12 (♀ only).

S. d. Kraus & Kraus, 1989: 208-214, f. 104-105, 111-112, 126-131, 142-173, Map 9 (♂♀).

World Distribution: Mauritania, Mali, Algeria, Tunisia, Libya, Egypt, Sudan, Ethiopia, Somalia, Yemen, Senegal, (Upper Volta, Niger, Tchad ?).

Distribution in Sudan:

- El Khandaq (6♀ BMNH 20.10.35; Sudan Agric. Res. Serv. leg. 30.III. 1936).
- Suakim (5♀ 2♀ pre-Epig. ZMB 3897; Stecker leg. X. 1886).
- Wadi Halfa (1♀ Holotype of *niloticus* MNHN AR929).

Stegodyphus lineatus (Latreille, 1817) Figs. 3-4, 9, 11.

S. l. deserticola Simon, 1908: 79 (D).

S. l. Simon, 1910: 286-287, f. 4A (♂♀).

S. l. deserticola Simon, 1910: 287 (♀).

S. l. Kraus & Kraus, 1989: 231-235, f. 1-2, 28, 202-205, 227-228, 234-242, pl. 3 (f. A-E, G), Map 7 (♂♀).

World Distribution: Spain, Italy, Greece, Turkey, Palestine (Israel), Jordan, Syria, Iraq, Iran, Uzbekistan; Mauritania, Morocco, Algeria, Tunisia, Libya, Niger, Tchad, Egypt, Saudi Arabia, Sudan, Yemen.

Distribution in Sudan:

- Khartoum (1♀ pre-epig. MRAC 120.761; Cloudsley-Thompson leg. 1960-61).

***Stegodyphus manicatus* Simon, 1876** Figs. 5, 6, 12-22.

S. m. Simon, 1876: 87 (♀).

S. m. Simon, 1908: 79-80 (♀, non ♂).

S. m. Simon, 1910: 288 (♀ only, ♂ = *S. dufouri*).

S. m. Berland & Millot, 1940: 158-159, f. 10A-B (♀, non ♂ = *S. dufouri*).

S. assomptioni Berland & Millot, 1940: 159-160, f. 11 (♂, nec ♀).

S. m. Kraus & Kraus, 1989: 218-220, f. 108, 114-115, 188-194, Map 6 (♂, ♀).

World Distribution: Senegal, Mali, Niger, Tchad, Sudan, Ethiopia. Mostly south of the Sahara (Kraus & Kraus, 1989: 249, Map 6).

Distribution in Sudan:

- Khartoum (1♀ MRAC 123.051; Cloudsley-Thompson leg.).

- Kassala (1♂ MRAC 133.678; Clarkson leg. 1951).

- Suakim (1♀ ZMB [ex 3897]).

[BMNH = The Natural History Museum, London, United Kingdom

MNHN = Muséum National d'Histoire Naturelle, Paris, France

MRAC = Musée Royal de l'Afrique Centrale, Tervuren, Belgium

ZMB = Museum für Naturkunde, Humboldt-Universität, Berlin, Germany]



Figs. 1-5. Habitus, dorsal view. 1-2. *Stegodyphus dufouri* (Audouin, 1825) 1. ♂. 2. ♀. (Specimens from Egypt.) 3-4. *Stegodyphus lineatus* (Latreille, 1817) 3. ♂. 4. ♀.



5. *Stegodyphus manicatus* Simon, 1876 ♂.
[Fig. 11A, after Berland & Millot, 1940: 159]

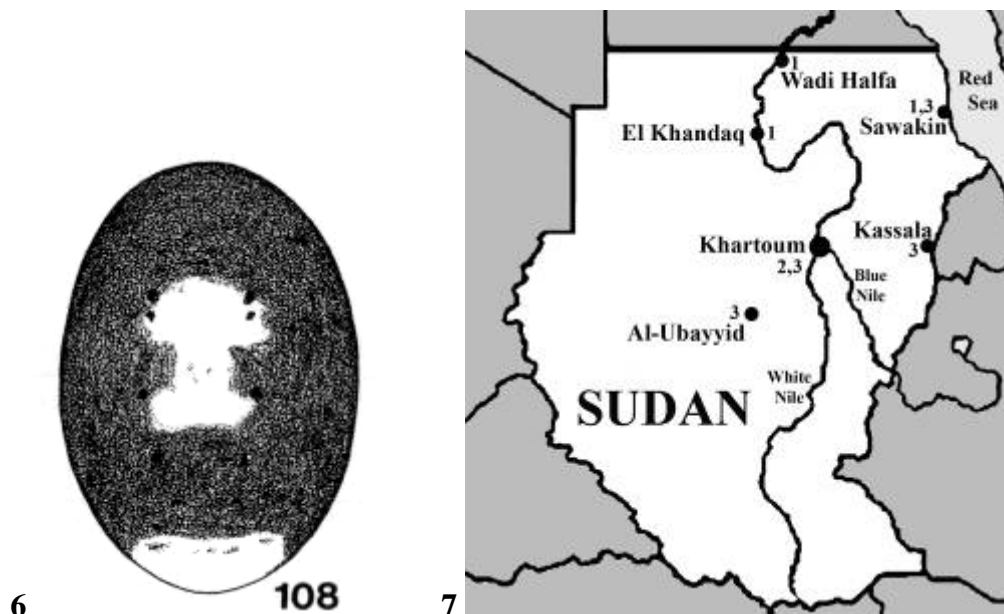


Fig. 6. *Stegodyphus manicatus*, dorsal colour pattern of opisthosoma (♂).
[Fig. 108, after Kraus & Kraus, 1989: 200]

Fig. 7. Distribution map of *Stegodyphus* species of Sudan.

1 = *Stegodyphus dufouri*, 2 = *Stegodyphus lineatus*, 3 = *Stegodyphus manicatus*.

[Wadi Halfa 21°47'35"N, 31°22'16"E; El Khandaq 18°36'00"N, 30°33'60"E;

Sawakin 19°06'01"N, 37°19'56"E; Khartoum 15°34'48"N, 32°31'12"E;

Kassala 15°27'36"N, 36°23'24"E; Al-Ubayyid 13°12'11"N, 30°19'22"E]

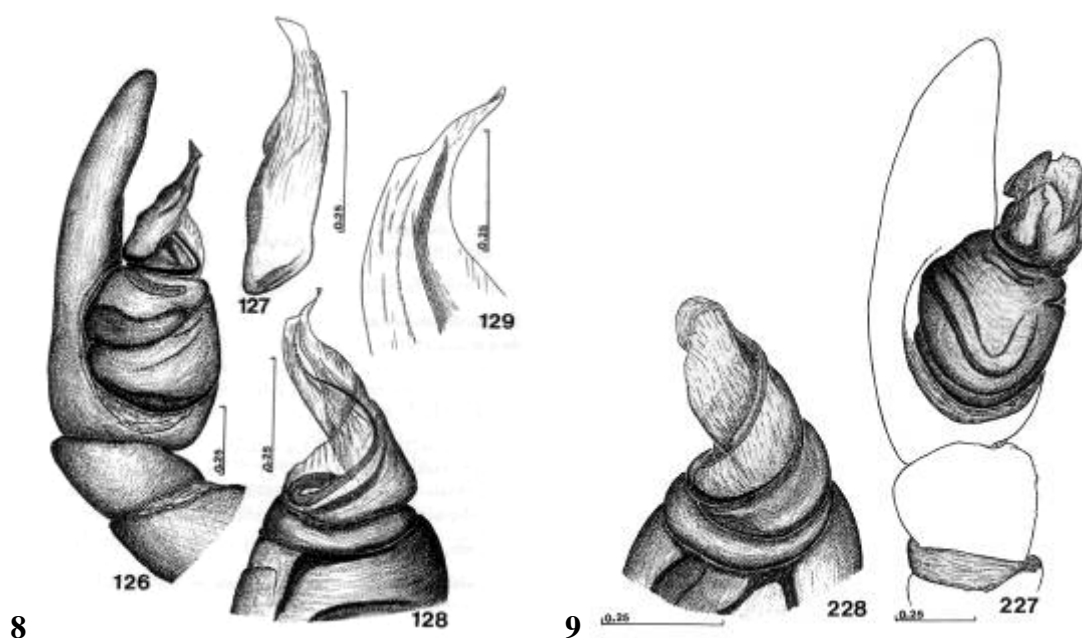


Fig. 8. Male pedipalp and terminal lamella of *Stegodyphus dufouri*, Egypt, Djebel Mokattam. [Figs. 126-129, after Kraus & Kraus, 1989: 203]

Fig. 9. Male pedipalp and terminal lamella of *Stegodyphus lineatus*. [Figs. 227-228, after Kraus & Kraus, 1989: 229]

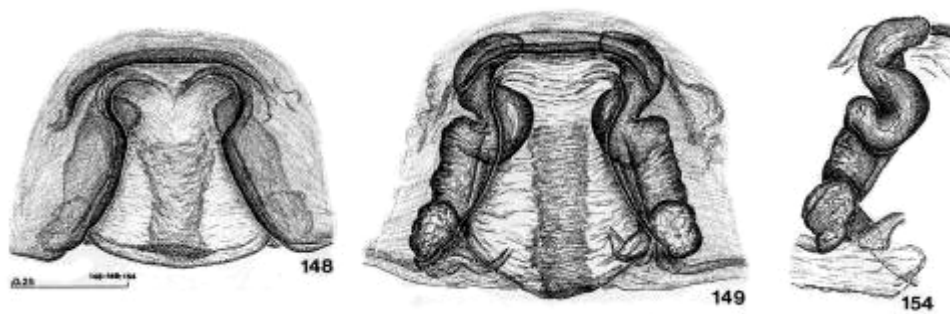


Fig. 10. *Stegodyphus dufouri* epigynum and vulva, type of *niloticus*. 148-149. Ventral view, 154. Dorsal view. [Figs. 148-149, 154, after Kraus & Kraus, 1989: 210]

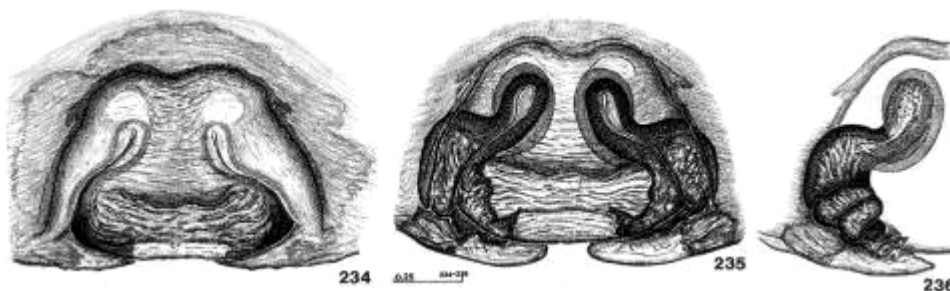


Fig. 11. *Stegodyphus lineatus* Epigynum and vulva. 234-235. Ventral view. 236. Vulva, dorsal view. [Figs. 234-236, after Kraus & Kraus, 1989: 230]

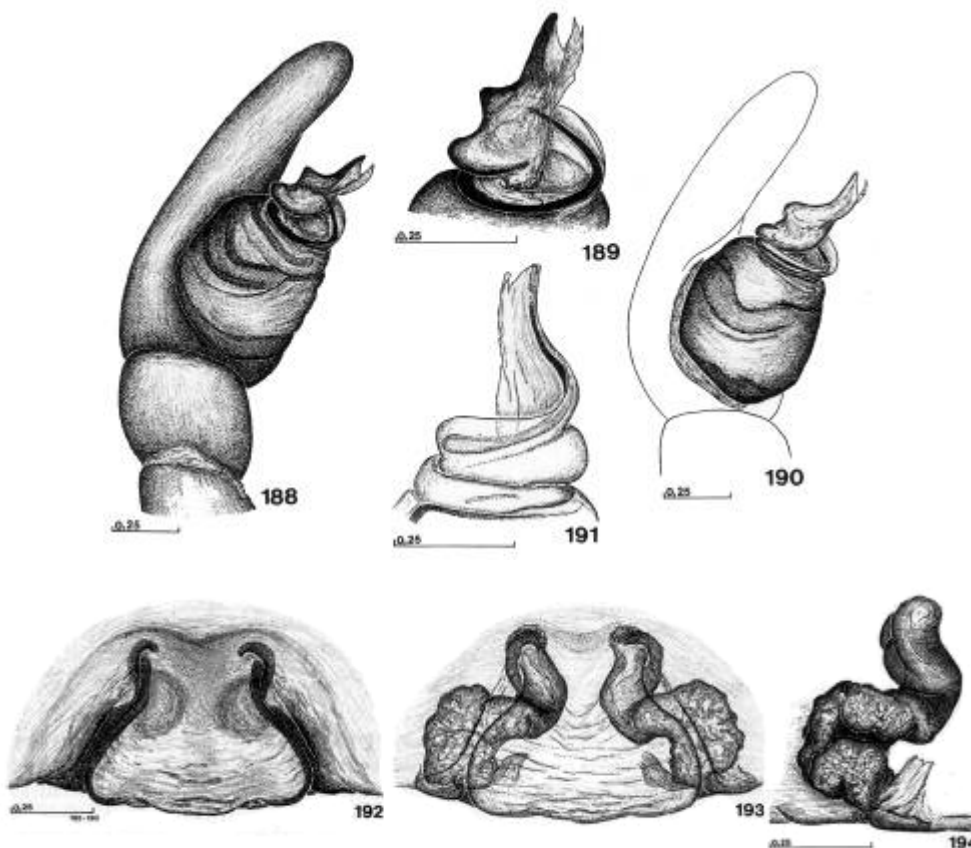


Fig. 12. *Stegodyphus manicatus*. 188-191. Male pedipalp and details of terminal lamella [188-189: type of *assumptioni*, 190-191: other specimen]. 192-194. Epigynum and vulva, ventral and dorsal view [type of *manicatus*]. [Figs. 188-194, after Kraus & Kraus, 1989: 219]

Key to *Stegodyphus* species in Sudan

<i>Stegodyphus</i>	<i>dufouri</i>		<i>lineatus</i>		<i>manicatus</i>	
	♂	♀	♂	♀	♂	♀
L leg I : L cephalothorax	3.1-3.2	2.4-2.9	2.8	2.2	2.5-2.9	2.2
W PME : W AME	1.2	1.0-1.3	1.2	1.2	1.4-1.5	1.4-1.5
Abdominal pattern	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Figs. 5-6	---
♂ Palpal organ	Fig. 8		Fig. 9		Fig. 12	
♀ Epigynum and vulvae		Fig. 10		Fig. 11		Fig. 12

Stegodyphus manicatus from Kordufan, Sudan (Figs. 13-22).

Description: Female (Fig. 18): TL 16.142; Cephalothorax (Fig. 16) L 5.95. Cephalic part: L 3.825, W 3.57; L : W = 1.07; elevated, reddish orange, covered by white hairs, except ocular region, frontal region of prosoma, clypeus and chelicerae covered by black hairs. Thoracic part: L 2.125, W 3.825; L : W = 0.55; colouration similar to cephalic part, but with sparse white hairs. Eyes: transparent; AME and PLE equal; posterior medians (PME) largest, slightly larger than anterior laterals (ALE) and 1¼ times larger than anterior medians (AME) and posterior laterals (PLE). Median ocular area wider than long. Eye measurements (diameters and interdistances): AME 0.204, ALE 0.238, PME 0.255, PLE 0.204, AM-AM 0.238, AL-AL 2.414, PM-PM 0.374, PL-PL 2.006, AM-AL 1.09, AM-PM 0.136. (Id PME : Id AME = 1.57; Id PLE : Id ALE = 83.09%). Chelicerae: covered by dense black hairs. Sternum dark orange. Labium and maxillae: reddish orange, except internal parts white. Pedipalps: dark orange, covered by black hairs on first and second segments. Legs: orange yellow, covered by white hairs. Metatarsus and tarsus IV blackish. Leg II darker than III & IV. Leg I darker than II, with dense black hairs on femur, prolaterally and ventrally, and tibia, only prolaterally. Calamistrum about ⅔ the length of metatarsus IV retrolaterally (Fig. 17).

Table 1: ♀, Legs measurements (mm).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total length
I	4.081	2.385	2.65	2.915	1.59	13.621
II	3.339	1.749	1.908	1.749	1.06	9.805
III	2.12	1.696	1.431	1.59	0.795	7.632
IV	3.71	2.226	2.65	2.385	1.113	12.084

Relative length of legs 113 : 81 : 63 : 100. Leg formula I-IV-II-III.

L leg I : L cephalothorax = 2.29.

Spination pattern: ventrally: two distal spines on metatarsus I; two distal + two median spines on metatarsi and two distal spines on tibiae II-IV; none elsewhere.

Abdomen: L 10.192; Creamy white dorsally and ventrally, covered by short hairs (Figs. 15, 19). Cribellum bipartite (L 0.583). Epigynum (Fig. 20), W 0.612 ventrally after separating and clearing, and vulvae similar to those figured by Kraus & Kraus (1989: Figs. 192-194) (Fig. 12) except the distance between vulvae, which are contiguous in Kordufan's specimen (Figs. 21-22).

Distribution: *S. m.* was previously recorded from Khartoum, Kassala, and Suakim (Sawakin) (Kraus & Kraus, 1989). The new material studied was collected near Al-Ubayyid: 3 juveniles, from Khor Tagget (13°12'11.5"N, 30°19'22.2"E, Alt. 559m), near Faculty of Science, Kordufan University, 28 July 2008, in their webs on bark of *Adansonia digitata*, Tabaldi tree (Baobab); 1 juvenile, from its nest among *Acacia*

bagworm cocoons (*Auchmophila kordofensis*), on *Acacia nubica* tree, beside the road from Al-Ubayyid to Kazgail (13°06'15.9"N, 30°11'17.3"E, Alt. 585m), 29 July 2008 (Fig. 7).

The described female was one of those collected juveniles, reared in Khartoum and Cairo. Only two moults were observed, 18 August 2008 and 17 September 2008. She lived until 27 June 2009 and preserved on the next day.

Biology and Habitat

The male type of *S. assomptioni* was “captured in the garden of the governor inside a small lodge of silk fixed on a shrub’s branch” (Berland & Millot, 1940: 160). Kordufan juvenile specimens were found in their webs on bark of *Adansonia digitata*, Tabaldi tree (Fig. 13) and among *Acacia* bagworm cocoons (*Auchmophila kordofensis*) on *Acacia nubica* tree.

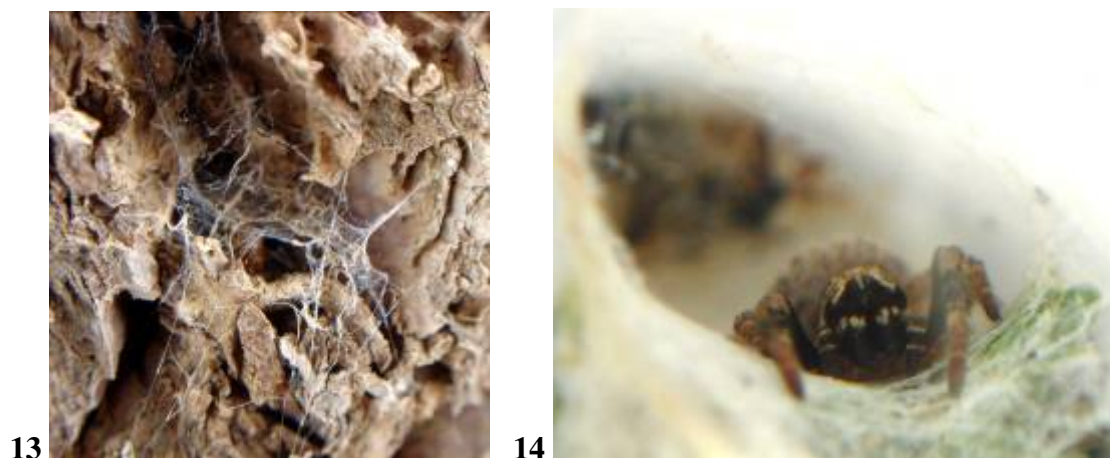


Fig. 13. Web of juvenile *Stegodyphus manicatus* on tree trunk bark.
Fig. 14. Juvenile *Stegodyphus manicatus* at nest's entrance.



Fig. 15. Subadult female seizing her prey, *Musca domestica*.
Fig. 16. Female's cephalothorax. Fig. 17. Female's calamistrum on metatarsus IV.

In west Africa, Millot & Bourgin (1942: 299) reported the presence of *S. manicatus* in a colony. Kraus & Kraus (1989: 220) had seen 13 females from Niger col-

lected together with their large nest that showed funnel-like tubes. They reported that “Various cocoons contained nymphs and the succeeding instar; they must have been produced nearly simultaneously, i.e., by different females”. They stated “It is not quite clear whether the species may occur in colonies or may perhaps (!) be a social-living species”.

S. manicatus juveniles, subadults and adult were reared on different kinds of prey, i.e., bees, wasps, flies, and sometimes caterpillars (Fig. 15). They were very fast in attack and in subduing the prey. They built dense silk nests, each with a single entrance. The colouration of the juvenile was slightly different, with less black hairs on frontal region of prosoma, chelicerae, and legs (Fig. 14).



Fig. 18. *Stegodyphus manicatus* Simon, 1876. ♀.

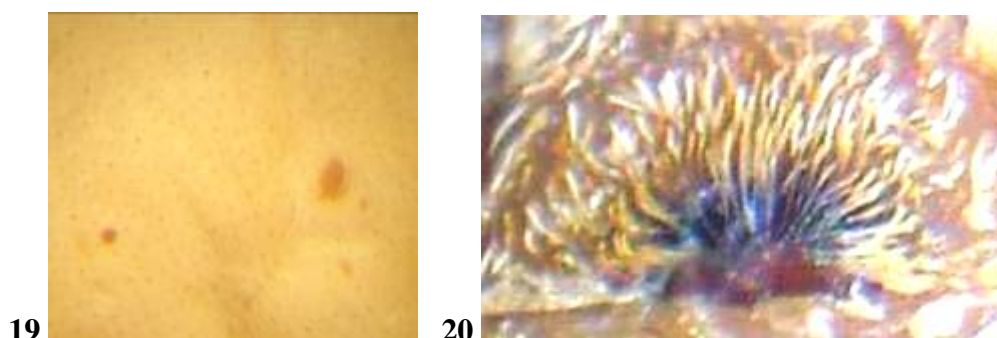


Fig. 19. Cuticle of adult female's abdomen. Fig. 20. Epigynum, ventral view.

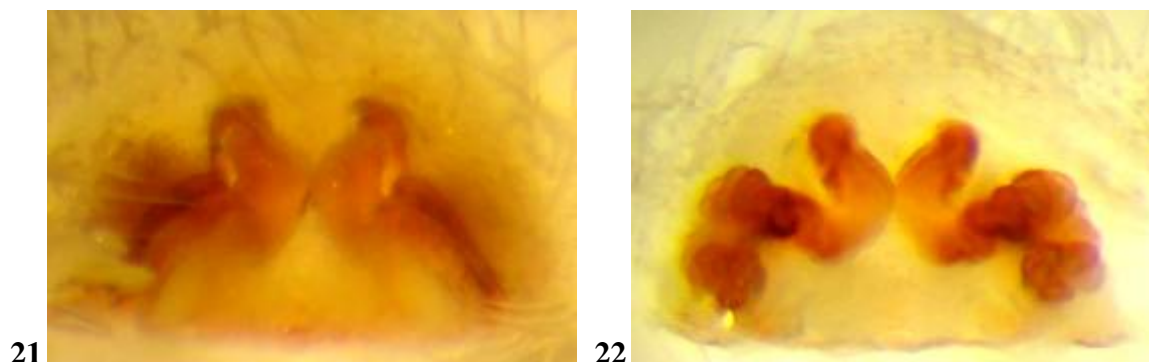


Fig. 21. Epigynum, ventral view, after separating and clearing.
Fig. 22. Vulvae, dorsal view.

Acknowledgments

I am grateful to Prof. Dr. Tigani M. H. Allam, the director of the Natural History Museum, University of Khartoum, who invited me to visit Sudan (23 July - 10 August 2008). His generosity, his kind help and his wide scope of both culture and science are unforgettable. My sincere thanks are due to all Sudanese colleagues who helped me during my visit to Sudan and made me eager to study its fauna.

I am grateful too to Prof. Dr. Mashaal A. Saleh, the dean of Faculty of Science, Kordufan University who made my visit to Kordufan possible and hosted me there.

My sincere thanks are due to my Sudanese friends Fathy, Serr, Sara, and Aasem who helped me much during my visit to Kordufan.

References

- Audouin, V. 1825. *Explication sommaire des planches d'Arachnides de l'Égypte et de la Syrie, Publiées par Jules-César Savigny*. In: Description de l'Égypte ou Recueil des observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'armée française. Histoire Naturelle. Tome Premier 1809. Paris. 4e partie, pp. 99-186. Atlas: pls. 1-9 (Arachnides).
- Audouin, V. 1827. *Ibid.* 2nd edition. vol. 22, pp. 291-430.
- Berland, L. & Millot, J. 1940. Les araignées de l'Afrique occidentale française. II. Cribellates. *Annales de la Société Entomologique de France*, 108: 149-160.
- Jocqué, R. & Dippenaar-Schoeman, A.S. 2006. *Spider Families of the World*. Musée Royal de l'Afrique Central, Tervuren, 336 pp.
- Kraus, O. & Kraus, M. 1989. The genus *Stegodyphus* (Arachnida, Araneae). Sibling species, species groups, and parallel origin of social living. *Verh. naturwiss. Ver. Hamburg*, 30: 151-254.
- Millot, J. & Bourgin, P. 1942. Sur la biologie des *Stegodyphus* solitaires (Aranéides Érésides). *Bulletin biologique de la France et Belgique*, 76: 298-313.
- Platnick, N.I. 2009. *The world spider catalog*, version 10.0. American Museum of Natural History, online at <http://research.amnh.org/entomology/spiders/catalog/index.html>
- Simon, E. 1876. Diagnoses de nouvelles espèces d'Arachnides. *Annales de la Société Entomologique de France*, (5) 6(Bull.): 86-88.
- Simon, E. 1908. Étude sur les espèces de la famille des Eresidae qui habitent l'Égypte. *Bulletin de la Société Entomologique d'Égypte*, 1: 77-84.
- Simon, E. 1910. Catalogue raisonné des arachnides du nord de l'Afrique (1re partie). *Annales de la Société Entomologique de France*, 79: 265-332.